

THE USE OF PRP IN TENDON INJURIES

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Platelet-Rich Plasma (PRP) has been introduced in the clinical practice to treat a growing number of different musculoskeletal pathologies and is currently one of the most exploited biological strategies to modulate tissue response to damage with the aim of stimulating regeneration in tissues characterized by a low intrinsic healing potential. Among these, tendinopathies are a troublesome condition which affects a high number of athletes in every kind of sport as well as middle aged non active patients. Tendons can repair and heal naturally, but the repaired tissue is usually functionally and biomechanically less competent than native tendons, owing to the scar tissue formation. A solution to increase the tendon healing potential could heavily improve the management of tendinopathies. Basic science studies have shown that healing tendon is responsive to the local application of Growth Factors (GFs), and PRP offers an easy and inexpensive way to obtain many of the GFs responsible for tendon regulation. PRP is derived from the centrifugation of autologous whole blood and it contains a platelet concentration that is 4 to 5 times higher than normal blood, thus offering a high concentration of GFs in physiologic proportions. Releasate from PRP has been seen to stimulate gene expression of the matrix molecules and tendon cell proliferation and promote the synthesis of angiogenic and other GFs, and also activate circulation-derived cells that play an important role in the tissue healing process. Animal studies have shown the usefulness of platelet concentrate for the treatment of tendon lesions, and some preliminary results in humans seem to confirm its potential, but contradictory studies have also been reported. Overall, the paucity of high-level literature regarding the application of PRP in the management of tendinopathy makes it very hard for clinicians and researchers to understand clearly the role of this biological approach. Besides considerations regarding the level of evidence of the available studies, other controversial aspects should be considered. First of all, the marked inter-product variability and the different application strategies currently in clinical use have to be remembered. The different cell types and concentrations provided by different procedures and applied to the lesion site are a fundamental aspect since even small variations in GFs concentrations can produce different effects. Timing and number of injections are also important and should be further investigated since they might influence the clinical outcome. Another crucial aspect regards cellularity, since leukocytes, monocytes, macrophages and mast cells are contained in platelet concentrates and may play a role in the effects exerted on the tendon tissue. Furthermore, the storage procedure, if used, is thought to have an impact on the amount and pattern of GFs released, and also the activation method may influence the results. All these possible variables impede knowing the best formulations to adopt for the treatment of tendinopathies, and current clinical data do not allow any specific product feature to be linked to clinical outcome, either positively or negatively. In light of these findings, further high-quality studies are needed, with the aim of identifying the optimal PRP properties and applicative modalities to treat tendinopathies. Finally, another central aspect is the role of concurrent treatment: in fact, PRP is always associated with a rehabilitation protocol that itself plays a major role in the therapeutic process. It is impossible to assess the contribution of PRP administration to tendon healing alone, but some studies have suggested that biological stimulation can be enhanced by appropriate physical therapy. Therefore, current indications suggest combining both approaches to treat this kind of patients.

Conclusion

The clinical data available, although not univocal, suggest considering PRP as an option for the management of tendinopathies. Clearly it must be remembered that there are marked anatomical and biomechanical differences among tendons, thus implying different etio-pathological pathways and probably inherent different responses to biological stimulation. However, based on the trials published, in general PRP seems useful for tendinopathies not responsive to other conservative procedures and, at the moment, it can be considered as a second-line treatment approach.